

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
6 May 2004 (06.05.2004)

PCT

(10) International Publication Number
WO 2004/037461 A1

(51) International Patent Classification⁷: **B21D 28/02**,
35/00, 53/00

(21) International Application Number:
PCT/IT2003/000620

(22) International Filing Date: 13 October 2003 (13.10.2003)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
PD2002A000274 22 October 2002 (22.10.2002) IT

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

Declarations under Rule 4.17:

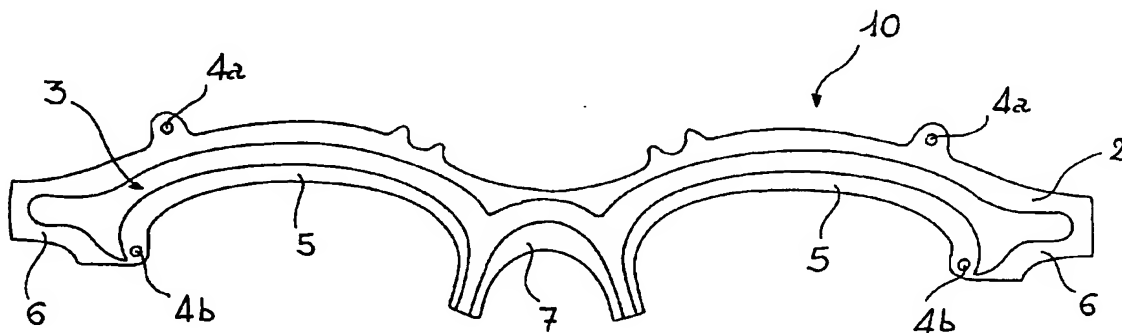
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- *of inventorship (Rule 4.17(iv)) for US only*

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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(54) Title: A METHOD OF PROCESSING METAL PARTS BY BLANKING



(57) Abstract: A method of processing metal parts and the like by blanking is described and comprises the steps of performing a first blanking step on a semi-finished product (1) in order to produce a blanked semi-finished product (20), and of performing a subsequent processing of the blanked semi-finished product to produce a finished product (30, 40), wherein the first blanking step is performed leaving an allowance on the blanked semi-finished product (20), and wherein the subsequent processing comprises at least one second blanking step by which the allowance is removed from the blanked semfinished product.

A method of processing metal parts by blanking

DESCRIPTION

Technical field

The present invention relates to a method of processing metal parts
5 and the like by blanking according to the preamble to main Claim 1.

Technological background of the invention

According to the prior art, the blanking of metal parts in a press, also
known as punching, is an operation which brings about the detachment of a
portion from a semi-finished product along an outline corresponding to the
10 cross-section of a blanking tool, that is the punch, and of a respective die.
The cutting takes place owing to the pressure exerted by the punch during its
working stroke on the semi-finished product disposed on the die.

Blanking is widely used in various fields by virtue of the low costs and
fast production that are typical of this process. However, it has some
15 disadvantages such as, for example, poor surface finishing of at least a
portion of the detachment region. In fact a portion of the surface resulting
from blanking has imperfections such as signs of tearing and the like which
are not acceptable in the finished product in some cases. Generally, about
1/3 of the surface produced during blanking is cut and the remaining 2/3 is
20 torn so that the part has to be reprocessed by further finishing processes, for
example, bevelling or polishing, to attenuate the above-mentioned surface
imperfections. However, these operations lead to a considerable increase in
processing costs.

Description of the invention

25 The problem underlying the present invention is that of providing a
method of processing metal parts by blanking that is designed to overcome
the limitations discussed above with reference to the prior art mentioned.

This problem is solved by the present invention by means of a method
of processing parts by blanking in accordance with the appended claims.

30 Brief description of the drawings

The characteristics and the advantages of the invention will become
clearer from the following detailed description of a preferred embodiment

thereof which is described by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view of a semi-finished metal product to be processed in accordance with the method of the invention,
- 5 - Figure 2 is a perspective view of the semi-finished product of Figure 1 after a first processing step,
- Figure 3 is a perspective view of the semi-finished product of Figure 2 after a further processing step,
- Figure 4 is a perspective view of the semi-finished product of Figure 3 after a further processing step,
- 10 - Figure 5 is a perspective view of the semi-finished product of Figure 4 after a further processing step, and
- Figure 6 is a schematic view of a detail of the semi-finished product of Figure 3, in section and on an enlarged scale.

15 Preferred embodiment of the invention

With reference first of all to Figure 1, a semi-finished product made of metal such as, preferably, brass, nickel silver, aluminium, precious metals, or the like, prepared for processing according to the method of the invention, is indicated 1.

20 The drawings show a semi-finished product for the production of a spectacle frame; however, the method according to the invention is directed towards the processing of semi-finished products irrespective of their final purpose and can therefore be used in various technical fields, such as goldsmithery, precision mechanics, spectacle production, etc.

25 According to the method of the invention, the semi-finished product 1, which has a predetermined shape produced by conventional blanking or by stamping, is first of all processed by coining to produce a coined semi-finished product 10, on one surface 2 of which an imprint 3 of the shape of the finished product to be produced is coined. The imprint 3 is preferably formed in high relief.

30 The coined semi-finished product 10 is shaped as a portion of a spectacle frame and, in particular, comprises two upper portions of lens-holding rims 5 connected by a bridge 7, and two shoulders 6.

A plurality of projections is also formed on the surface 2 of the coined semi-finished product 10 by the coining step; in this preferred example, a first and a second pair of appendages 4a, 4b are formed for locating the coined semi-finished product 10 on a die (not shown) for the subsequent
5 blanking step.

The coined semi-finished product 10 is then subjected to a first blanking step by means of a conventional die and punch, so as to produce a blanked semi-finished product 20 having the characteristics described below.

During this first blanking step, the coined semi-finished product 10 is
10 blanked, leaving an allowance which affects its entire blanking profile or at least the surfaces that are visible in the finished product. In practice, the die and the punch are larger than is necessary for blanking to finished dimensions; by an amount equal to the preselected allowance. According to a principal characteristic of the invention, the thickness S of the allowance is
15 between 0.1 and 1 mm and preferably between 0.2 and 0.25 mm.

Moreover, during the first blanking step, the first pair 4a of locating appendages of the coined semi-finished product 10 is removed.

The surface blanked in this first blanking step, in which the blanked semi-finished product 20 is produced, has the typical imperfections due to
20 blanking, that is, a generally major portion of the thickness bears signs of tearing.

The blanked semi-finished product 20 is then blanked for a second time so as to produce a final product 30 of the desired dimensions. In this second blanking step, the allowance remaining after the first blanking and also the
25 second pair of locating appendages 4b are removed.

Surprisingly, it has been found that the number and density of imperfections of the surface of the final product 30 that is involved in the second blanking are greatly reduced in comparison with the semi-finished product 20 produced by the first blanking step so that the blanked surface is
30 homogeneous and substantially free of signs of tearing.

It is pointed out that the second pair of appendages 4b is preferably formed in surfaces of the semi-finished product that can be processed further after the second blanking step and/or which are not in view in the finished

product; in the example described, which relates to a product that is intended to constitute the front portion of a spectacle frame, the second pair of appendages 4b is formed on the inside of the lens-holding rim portions 5. In the region of these projections, the blanked surface portion of the final product 30 bears signs of tearing and more marked imperfections than the remaining surface since it is subjected to a single blanking step, but a chamfering step is subsequently performed on the inside of the lens-holding rim 5 for the fixing of the lenses to the spectacle frame and the surface portion affected by the locating appendages 4b is therefore reprocessed.

In order also to remove the remaining irregularities, the final product 30 may be polished, for example, by tumbling until the desired surface uniformity is achieved, as shown, for example, in Figure 5 in which a final polished product is indicated 40.

The invention thus solves the problem posed, affording many advantages over the prior art mentioned.

A first advantage consists of the fact that, by virtue of the method of the invention, the final product has a surface finish which is considerably improved in comparison with a semi-finished product conventionally blanked only once. In particular, the surface portion which may bear signs of tearing is considerably smaller.

Moreover, the method of the invention permits production with limited costs, lower than those of production by other methods which give an equally homogeneous surface.

CLAIMS

1. A method of processing metal parts and the like by blanking, comprising the steps of performing a first blanking step on a semi-finished product (1) in order to produce a blanked semi-finished product (20), and of performing a subsequent processing of the blanked semi-finished product to produce a final product (30, 40), characterized in that the first blanking step is performed leaving an allowance on the blanked semi-finished product (20), and in that the subsequent processing comprises at least one second blanking step by which the allowance is removed from the blanked semi-finished product.

2. A method according to Claim 1 in which the allowance has a thickness of between 0.1 and 1.0 mm.

3. A method according to Claim 2 in which the allowance has a thickness of between 0.20 and 0.25 mm.

4. A method according to one or more of the preceding claims in which the subsequent processing comprises a tumbling step after the second blanking step.

5. A method according to one or more of the preceding claims comprising, prior to the first blanking step, the step of coining of the semi-finished product (1) to produce a coined semi-finished product (10).

6. A method according to Claim 5 in which the coined semi-finished product comprises at least a first pair of locating appendages (4a) for locating the coined semi-finished product on a die in order to perform the first blanking step.

7. A method according to Claim 6 in which the coined semi-finished product comprises a second pair of locating appendages (4b), the first pair being removed during the first blanking step and the second pair being removed during the second blanking step.

8. A method according to Claim 7 in which the second pair of locating appendages (4b) is positioned on surfaces of the semi-finished product which are to be processed further after the second blanking step and/or which are not in view upon completion of the processing.

9. A method according to one or more of the preceding claims in which the final product (30, 40) is a portion of a spectacle frame.

10. A method according to one or more of the preceding claims in which the metal of the semi-finished product is selected from brass, nickel silver,
5 and aluminium.

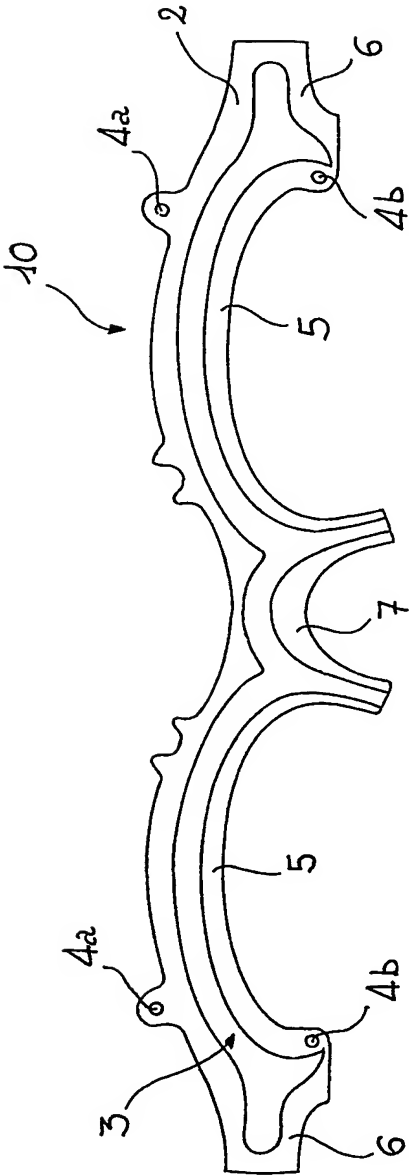
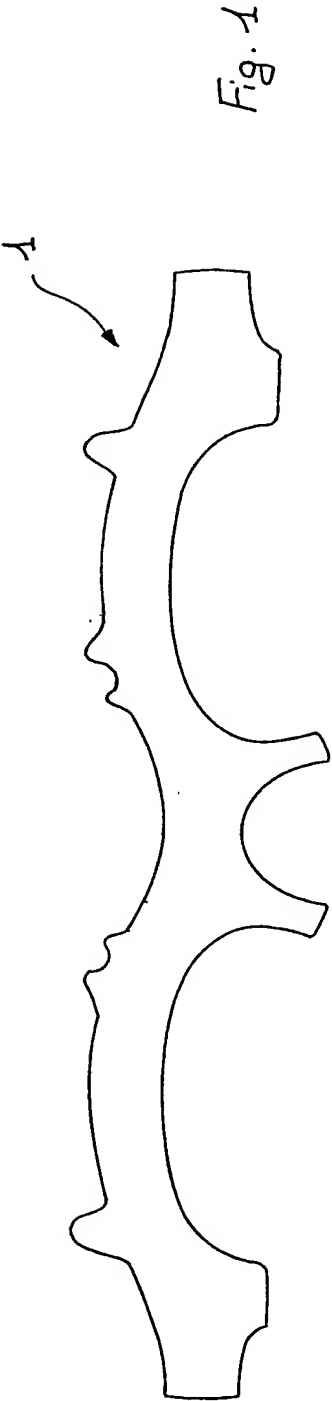


Fig. 2

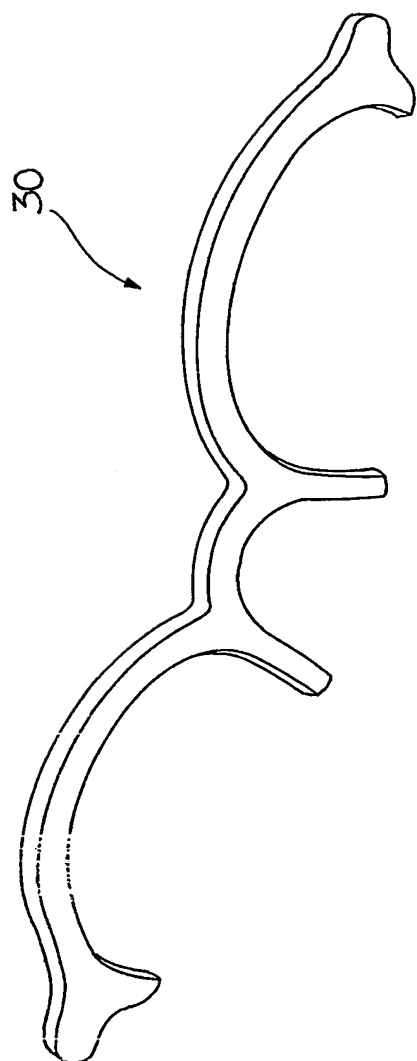


Fig. 4

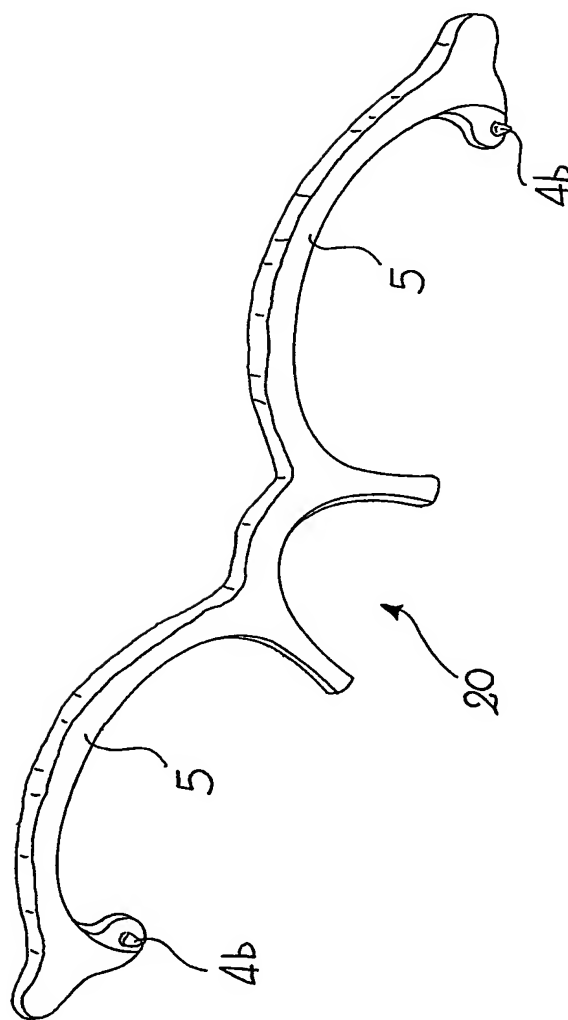


Fig. 3

Fig. 5

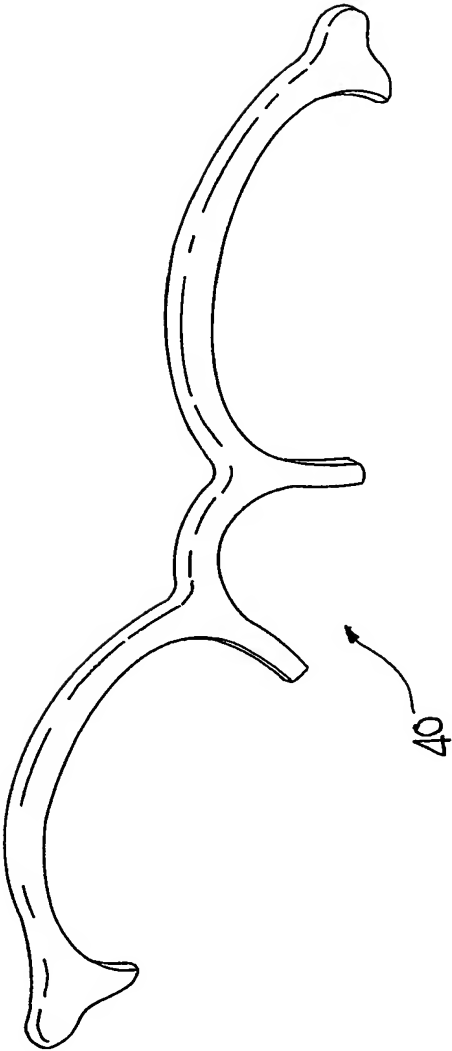
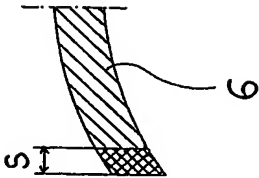


Fig. 6



INTERNATIONAL SEARCH REPORT

Inter Application No

PC, T 03/00620

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B21D28/02 B21D35/00 B21D53/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B21D G02C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 121 (M-382), 25 May 1985 (1985-05-25) -& JP 60 006299 A (SHINKO ELECTRIC IND CO LTD), 12 January 1985 (1985-01-12) abstract	1-6, 10
A	---	7, 8
X	PATENT ABSTRACTS OF JAPAN vol. 010, no. 002 (M-444), 8 January 1986 (1986-01-08) -& JP 60 166128 A (FUJITSU LTD), 29 August 1985 (1985-08-29) abstract; figure 5 ---	1-3, 10
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Patent family members are listed in annex.

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Date of the actual completion of the international search

18 February 2004

Date of mailing of the international search report

26/02/2004

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

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Application No

PCT/JP 03/00620

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 223 578 B1 (KAMIJO TADASHI) 1 May 2001 (2001-05-01) column 2, line 41-51 column 5, line 22-29 figures 2,4,5	1-6,10
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 10, 31 August 1999 (1999-08-31) - & JP 11 133359 A (KATO MEGANE KK), 21 May 1999 (1999-05-21) abstract	9

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Application No

PCT/JP 03/00620

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